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**Entrepreneurial orientation and the job demands-resources model**

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**Abstract**

*Purpose* - The purpose of this paper is to examine the influence of entrepreneurial orientation (EO) within the framework of the job demands-resources (JD-R) model.

*Design/methodology/approach* - The sample of N=597 white-collars in the German media and IT industry is drawn via the professional network XING. Cross-sectional mediator models are used to test the hypothesis.

*Findings* - The processes proposed by the JD-R model find empirical support. Job demands primarily cause exhaustion while job resources increase job satisfaction. Besides, job demands reduce job satisfaction and job resources lead to less exhaustion. An exception is found for cognitive workload which rather acts like a job resource. EO mediates these effects in a favorable way. High job resources foster EO, which in turn reduces exhaustion and enhances job satisfaction. For job demands, EO shows a negative mediation reducing the health-impairment process and increasing job satisfaction.

*Research limitations/implications* - Future research should broach the issue of adverse effects related to extreme employee entrepreneurship and potential negative effects.

*Practical implications* - Supporting and supervising an EO may help employees to cope with modern job profiles in agile organizations.

*Originality/value* - The findings provide support for a favorable mediating role of an entrepreneurial personal resource within the JD-R model. This knowledge may be used to consider individual work orientations and to organize work in a "healthy" way.

**Keywords:** Quantitative, Entrepreneurial orientation, Job characteristics, JD-R model, Personal resources, Mediation effects

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# Introduction

The job demands-resources (JD-R) model explains aspects of employee well-being like burnout or work engagement based on job characteristics (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The model has found empirical support in manifold ways and it has proven its adaptability to various job settings like call-center jobs (Bakker, Demerouti, & Schaufeli, 2003), teaching jobs (Hakanen, Bakker, & Schaufeli, 2006), white-collar work (Schaufeli & Bakker, 2004), across countries and occupational groups (e.g. Llorens, Bakker, Schaufeli, & Salanova, 2006), and different individual outcomes (e.g. Hansez & Chmiel, 2010). Hence, the JD-R Model represents a conceptual framework that can be adapted to specific situations and research questions (Schaufeli & Taris, 2014).

In recent years, several studies have used an integrative approach in combining the explanatory value of job characteristics from the JD-R model with a different approach concerning the impact of individual characteristics. This line of research has shown that personal resources (e.g. self-efficacy) have a substantial impact on the job characteristics/well-being link. The precise functioning though is not clearly determined. There is support for a mediating role of personal resources on the effect of job resources (Vink, Ouweneel, & Le Blanc, 2011) as well as for moderating and mediating effects on the effect of job demands (Brenninkmeijer, Demerouti, le Blanc, & van Emmerik, 2010; Huang, Wang, & You, 2015). Moreover, direct effects and an impact of personal resources on the perception of job conditions are reported (Schaufeli & Taris, 2014).

Another field of current research deals with fundamental changes in the professional world. IT has not only changed job conditions for the vast majority but it also has an impact on the organizational structure and the culture of many companies as well as on the employee's work orientations. Current concepts like the *agile organization* are based on self-controlled teamwork and a flexible mindset. An *entrepreneurial orientation* (EO), for instance, has become a main attribute of the ideal employee. Entrepreneurial initiative and self-responsible behavior in one's career and work activities is highly appreciated (European Union, 2006, 2015; Pongratz & Voß, 2003).

It seems obvious that work-related orientations should have a strong influence on the impact of job conditions proposed by the JD-R model. However, there is still little evidence on the way in which the impact of job conditions is influenced. Within an agile environment, an EO could be interpreted as a personal resource. Mapping the impact of an EO within the JD-R model is the aim of the present paper. We have surveyed job conditions and outcomes as well as the EO of employees in the IT and communication sector as this sector is most likely

to create environments that require EO. In the remainder, we first describe the theoretical background integrating social cognitive theory, conservation of resources theory and EO into the JD-R model before we present our empirical work and discuss our findings.

## Theoretical Background

### The Job Demands-Resources Model

Fundamentally, the JD-R model assumes that all kind of job characteristics can be classified into two categories that differ in terms of their effect (Demerouti et al., 2001). These are (1) job demands and (2) job resources. *Job demands* are those working conditions that require intensive physical, mental or even emotional efforts and therefore involve physical and/or mental costs. Excessive or ill-defined job demands cause a health-impairment process and lead to stress symptoms such as mental or physical exhaustion and, thus, adverse effects on health (Bakker, Demerouti, de Boer, & Schaufeli, 2003). Job demands can have different effects on different occupational groups. While emotional demands are widespread in services that require close contact with people, occupational groups that have no contact with customers may have to meet high mental demands. *Job resources* are those physical, social and workplace features that help (a) in the achievement of job-related objectives, (b) in the reduction of job demands and costs associated with them, and (c) in the promotion of personal growth and development. Job resources can cause both an intrinsic and an extrinsic motivational process (Bakker & Demerouti, 2007). As intrinsic motivators, they fulfil needs for things such as autonomy, competence development and a sense of belonging and thus ensure personal growth (Deci & Ryan, 1996). As extrinsic motivators, they inspire employees to exert themselves in their jobs and thus increase the likelihood of tasks being completed successfully and of job objectives being achieved (Bakker & Demerouti, 2007). Particularly influential job resources are autonomy, social support and feedback from superiors (e.g. Haines, Hurlbert, & Zimmer, 1991; Tomaževič, Seljak, & Aristovnik, 2014).

There are interdependencies between job demands and job resources. According to Karasek's approach (1979), job resources reduce the influence of stress and guard against excessive strain (Bakker & Demerouti, 2007). It is also postulated – in accordance with the conservation of resources (COR) theory (Hobfoll, 2002) – that the motivation potential of job resources also increases in particular when the job demands are high.

The JD-R model can be used universally in a variety of occupational groups that are typically examined within an organization. In contrast, the use of randomized supra-organizational

data – as in this study – is not very common (e.g. Kattenbach, Demerouti, & Nachreiner, 2010; Van Ruysseveldt, Proost, & Verboon, 2011). Also, the use of job satisfaction as a dependent measure instead of job motivation is less common, but possible (e.g. Nielsen, Mearns, Matthiesen, & Eid, 2011). The JD-R model can be used to explain not only motivation, but also organizational commitment (Hakanen et al., 2006; Salanova, Agut, & Peiró, 2005), turnover intention (Jourdain & Chênevert, 2010) and extra-role performance (Schaufeli & Bakker, 2004), aspects that are closely associated with job satisfaction. Moreover, job satisfaction is one of the most commonly researched subjects in occupational and organizational psychology (Cranny, Smith, & Stone, 1992; Fields, 2002) and it is a central indicator of the perceived quality of working life. Its effects on company factors such as productivity (George & Jones, 1996; Ostroff, 1992), work performance (Judge, Thoresen, Bono, & Patton, 2001), absence (Spector, 1997), fluctuation (Wright & Bonett, 1992) and extra-role performance (Williams & Anderson, 1991) are well supported.

In recent years, the JD-R model with its focus purely on job characteristics has been complemented by personal resources to understand the mutual relationships and to refine its explanatory value. The latter is even more important for the explanation of job satisfaction: Owing to the job satisfaction values which are very stable over time (Bayard, 1997) and personality-related differences, it can be concluded that differences in the workplace, e.g. working conditions, the management conduct of superiors or the conduct of colleagues, cannot fully explain job satisfaction (Wegge & van Dick, 2006). Job satisfaction is assumed to be also characterized by personality traits (Judge & Bono, 2001) and entitlement mentalities (Wegge & van Dick, 2006).

## Social Cognitive Theory, Conservation of Resources and Personal Resources

Personal resources are “aspects of the self that are generally linked to resiliency” (Hobfoll, Johnson, Ennis, & Jackson, 2003, p. 632) and generally refer to the ability to control and influence one’s environment successfully. In their report on the integration of personal resources into the JD-R model, Schaufeli and Taris (2014) mention two relevant approaches.

One group of studies investigates personal resources as mediators between job characteristics and well-being. COR theory (Hobfoll, 2002) constitutes the theoretical foundation of these studies. Accordingly, individuals seek to acquire and maintain resources (including objects, personal characteristics, conditions, and energies). Loss of resources (or

the threat of loss) induces stress, which in turn leads to anxiety, job dissatisfaction, and thoughts about leaving the job. To cope with stress, COR theory assumes that people invest in their resources to save them from losses or to recover from losses and to gain new resources. Through this, individuals strive to accumulate resources. Personal resources are treated as resources that may moderate or mediate the relationship between job characteristics and stress (Demerouti, Bakker, & Leiter, 2014; Schaufeli & Taris, 2014; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007).

Another group of studies refers to Bandura's (1997) social cognitive theory (SCT). They expand the JD-R model to personal resources that influence the perception of job characteristics. SCT explains the reciprocal relationship between human behavior, cognition and personal factors, and the environment. These three determinants mutually influence each other ("triadic reciprocal determinism"; Bandura, 1989). The environment, for instance, has an impact on behavior but human action also alters the environment. In a similar vein, the link between personality and behavior reflects the reciprocal interaction between what people think, believe, and feel as well as how they behave. The third relation between environment and personal factors is most relevant for our study. Environment refers both to the social environment (e.g. colleagues and supervisors) and the physical environment (e.g. job conditions). The individual's perception (cognitive representation) of the environment is referred to as the situation. Similar to the COR theory, personal characteristics (e.g. expectations, beliefs, feelings) are influenced by the environment through modeling, instruction and social persuasion (Bandura, 1986, 1989).

Both theories, COR and SCT, assume a mediating role of personal resources in the relationship between - or more precise: in the perception of - environment (working conditions) and positive/negative outcomes.

Following the development of positive organizational scholarship (Caza & Cameron, 2009), several studies have addressed the mediating role of personal resources using the JD-R model as theoretical foundation (Bickerton, Miner, Dowson, & Griffin, 2014; Guglielmi, Simbula, Schaufeli, & Depolo, 2012; Hur, Rhee, & Ahn, 2016; Liu & Cheung, 2015).

Xanthopoulou et al. (2007) show that self-efficacy, organizational-based self-esteem and optimism mediate the relation between job resources and work engagement/exhaustion and influence the perception of job resources. Similarly, Karatepe (2015) found that self-efficacy mediates the relationship between perceived organizational support and emotional exhaustion. On the contrary, two studies fail to support an assumed mediating effect of self-efficacy on the relationship between the job resource collegiality and in-role/extra-role performance (Xanthopoulou, Bakker, Heuven, Demerouti, & Schaufeli, 2008) and between

job resources and work engagement in general (Lo Presti & Nonnis, 2014). Quiñones et al. (2013) identify psychological empowerment (meaning, competence, choice and impact) as a mediating personal resource between job resources and work engagement.

Although a moderating effect of personal resources on the effect of job demands was assumed in earlier studies (Mäkikangas & Kinnunen, 2003; Pierce & Gardner, 2004). Xanthopolou et al. (2007) could not confirm this relationship. According to Huang et al. (2015), personal resources not only mediate the motivational process but also the health-impairment process. In a similar vein, Hu et al. (2013) reveal a mediation by an equity-based cognitive evaluation process not only between job resources and work engagement but also between job demands and burnout. These findings suggest that personal resources favorably mediate the motivational process between job resources and well-being as well as the health-impairment process between job demands and exhaustion within an extended JD-R model.

The concept of EO is strongly related to personal resources like self-control, psychological empowerment and self-esteem. Findings on the individual impact are scarce and theoretically not elaborated.

## Entrepreneurial orientation in the JD-R model

The concept of EO is strongly related to personal resources like self-control, psychological empowerment and self-esteem. Findings on the individual impact are scarce and theoretically not elaborated. EO deals with an individual's personal characteristics or attitudes that might increase the likelihood to get involved in entrepreneurial activities (Bolton & Lane, 2012). A broad set of variables have been used to measure entrepreneurial attitudes in individuals ranging from achievement over creativity to self-efficacy, self-esteem or self-confidence (see Rauch, Wiklund, Lumpkin, & Frese, 2009 for an overview). Sometimes, entrepreneurial attitude refers to innovativeness or creativity aspects; however, we are interested in the individual's orientation towards work and the individual's perception of entrepreneurial elements of work. In this sense EO can be characterized by autonomy need, competitiveness, performance optimization, and proactiveness (Höge, 2011; Pongratz & Voß, 2003; Rauch et al., 2009). Autonomy need is associated with self-discipline and the desire for independent planning, control, and supervision of one's work and relates to the general dimension of self-efficacy (Bandura, 1997). Performance optimization emphasizes a "marked eagerness to learn [as well as a] willingness to tolerate phases of excessive overexertion" (Pongratz & Voß, 2003, p. 131 translated by the authors). Competitiveness relates to constructs such as job and work involvement (Kanungo, 1982) and rivalry at the

workplace (Lumpkin & Dess, 2001; Nievergelt, 2004; Rauch et al., 2009). Proactiveness is an opportunity-seeking and forward-looking perspective (Miller, 1983), which in our study is characterized by the anticipation of future events and opportunities in life.

The EO is influenced by external expectations and requirements from the environment (Pongratz & Voß, 2003). This perspective is in line with Hobfoll's COR theory (2002) and Bandura's (1997) triadic reciprocal determinism in that the individuals shape their perception of the work environment through their EO and, in turn, their EO is influenced by the demands and resources of the work environment. Organizations are capable of stimulating entrepreneurial characteristics like autonomy need, performance optimization, and proactiveness through the design of job conditions and incentives.

The EO characteristics can be interpreted as an individual's entrepreneurial tendencies (Bolton & Lane, 2012; Rauch & Frese, 2007) and as a personal resource. We acknowledge that attributes like competitiveness and performance optimization also have a negative connotation since extreme or misguided manifestations may lead to self-exploitation or alienation (e.g. Pongratz & Voß, 2003; Tamizharasi & Panchanatham, 2010). Accordingly, Molino, Bakker and Gishlieri (2016) show that job demands can cause workaholism which in turn leads to stronger exhaustion. In the same vein, emotional dissonance mediates the individual effects of job demands as well as job resources (Molino, Emanuel, Zito, Ghishlieri, Colombo, & Cortese, 2016). Nevertheless, we assume (a moderate) EO as a personal resource and congruent with SCT and COR theory, we assume a mutually reinforcing relationship with job resources and a negative relationship with job demands and thus a favorable mediating effect of the EO not only on the motivational process but also on the health-impairment process.

Employees with a high EO should expect high job demands and, in accordance with the concept of being one's own entrepreneur, possibly regard them as a justification for their own position and remuneration in the organization. Thus, an EO might influence how individuals perceive their working conditions. Consequently, employees with EO are more prepared to cope with job demands and report less exhaustion. Such employees handle or perceive high job demands less negative, without this having any influence on job satisfaction (Süß & Sayah, 2011; Wilkens, 2004).

Based on these assumptions and our above argumentation on the reciprocal relationship of Bandura's (1997) SCT, we expect that EO is influenced by job demands and job resources alike. Employees who develop an EO make a more effective use of job resources and they



deal better with their job demands what leads to a higher job satisfaction and a lower level of exhaustion as postulated in the following hypotheses:

*Hypothesis 1a: EO partially mediates the link between job demands and exhaustion.*

*Hypothesis 1b: EO partially mediates the effect of job resources on exhaustion.*

*Hypothesis 2a: EO partially mediates the link between job resources and job satisfaction.*

*Hypothesis 2b: EO partially mediates the effect of job demands on job satisfaction.*

## Method

### Sample

The study was conducted among employees in the consultancy sector and in creative professions that are characterized by a high level of innovations, group and project work. The data was collected in spring 2010 as part of an online survey on the social network 'XING'. With 3.9 million members (August 2010) in the German-speaking area, XING is the biggest and most important occupation-related social media network in Germany. Among these members, people working in the IT (11 percent) and communications sector (13 percent) constitute a particularly large percentage. Randomly a total number of 4,000 employees from the IT and communications sector were contacted via personalized e-mails. 611 fully completed questionnaires were returned (15.3 percent return rate), N = 597 of which were included in the analysis, following verification of the employment situation.

The sample group comprises an equal number of employees from the IT (47.4 percent) and communications (47.7 percent) sector. The majority (76.8 percent) have highly skilled or managerial jobs. The jobs are for the most part project-based (67.5 percent). Males make up 60.1 percent of the sample group. The participants are between 20 and 62 years of age (Md = 36 years). 4.2 percent work in part-time.

### Measures

With job demands and resources as independent measures and exhaustion and job satisfaction as individual outcome variables, the basic structure of the collected data corresponds with the JD-R model (Figure 1). Job demands and resources are operationalized with five construct dimensions each. The dimensions of the job demands factor are workload, time pressure, cognitive workload, emotional demand, and role conflict.

The dimensions representing the job resources factor are development options, decision latitude, managerial ability, feedback, and social support. The JD-R model is also extended by the inclusion of EO as a mediating factor. For each item, seven-stage multi-item scales with different end and midpoints are used, on which participants specify the degree to which they agree with formulated statements.

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Figure 1 about here

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## Job demands

Except for two items, all items from the job demands scales were taken from the German version of the Copenhagen Psychosocial Questionnaire (COPSOQ; Nübling, Stößel, Hasselhorn, Michaelis, & Hofmann, 2005) and were adapted to the sample group.

*Workload* is surveyed based on two items. One example item is: "Does your workload cause you to fall behind with your work?" Cronbach's alpha reached .83. *Time pressure* at work is also assessed based on two items that address deadlines and working fast (e.g. "Do you have to work overtime because of deadlines that are too tight?"). Cronbach's alpha reached .72. *Cognitive workload* refers, based on four items, to the strain caused by many-sided, quick, difficult and creative challenges. An example item is: "Do you have to pay attention to many things at the same time in your job?" (Cronbach's alpha: .78) *Role conflict* is based on three items that look at inconsistencies regarding acceptance, working methods and demands (e.g. "Are you faced with contradicting demands in your job?"). Cronbach's alpha reached .77. *Emotional demand* is measured with three items (two of which are adapted on the basis of the Frankfurt Emotion Work Scales; Zapf et al., 1999) and one which is an item from the COPSOQ; Nübling et al., 2005). It captures the degree to which emotional demand of the kind that arises in work involving emotions is felt. For example: "Do you have to show positive feelings in your job, even if you don't have them?" Cronbach's alpha reached .79.

## Job resources

Job resources were assessed on the basis of five indicators, which were operationalized on the basis of the COPSOQ (Nübling et al., 2005) and Wilkens (2004).

The employee's *decision latitude* is represented by four items. An example item is: "On the whole, are you able to decide yourself how you do your tasks?" (Cronbach's alpha: .83).

*Growth potential* is assessed based on three items from the COPSOQ (e.g. “Is there variety in your work?”). Cronbach’s alpha reached .85. The *managerial ability* resource (three items adapted based on Wilkens, 2004), on the other hand, assesses the competence that is ascribed to the immediate superior in more detail (e.g. “Do you think your superior is competent?”). Cronbach’s alpha reached .90. *Social support*, a three-item measure adapted from Nübling et al. (2005) and Wilkens (2004), captures the support from superiors, team colleagues and other colleagues (e.g. “Do you get help and support from colleagues in your team?”). Cronbach’s alpha reached .62. Finally, *feedback culture* is addressed. Two items assess the frequency of feedback given by peers and superiors (e.g. “How often do your peers talk to you about the quality of your work?”). Cronbach’s alpha reached .62.

## Dependent variables

*Job satisfaction.* To avoid certain aspects in our survey being recorded more than once and blurring the cause-effect link between resources and strains on the one hand and job satisfaction on the other, a job satisfaction scale is needed that records the general affective reaction of an employee without going into specific facets of working life (e.g. pay, colleagues, career advancement). The Global Job Satisfaction (GJS) scale (Quinn & Shepard, 1974) fulfils this requirement. We use the modified form from Pond and Geyer (1991) with six items (e.g. “To what extent does your work comply with your ideas of the ideal job?”). Cronbach’s alpha reached .89.

*Exhaustion* is recorded with seven items of the Oldenburg Burnout Inventory (OLBI; Demerouti & Nachreiner, 1998). An example item is: “I often need more time to recover after work than I used to.” (Cronbach’s alpha: .84)

## Entrepreneurial orientation

To capture EO of employees, we developed a measure that covers different typical attitudes towards entrepreneurial behavior at the workplace. Following Rauch et al. (2009) the 16 items can be subsumed under the following four dimensions: autonomy need, competitiveness, performance optimization and proactiveness. The five items for *autonomy need* have been adapted from the general self-efficacy scale by Schwarzer and Jerusalem (1995) (e.g. “I think I can cope with unexpected events as well.”) and Holzbach’s (2007) pursuit of autonomy scale (e.g. “In my work it is very important for me to have decision latitude for my own.”). Furthermore, we have included *performance optimization* with four items (e.g. “I get very annoyed when I make mistakes at work.”) and *competitiveness* with two items (e.g. “Competition is an engine of human development, even in working life.”). The

items are taken from studies on job involvement (Lauck, 2005) and on rivalry at the workplace (Nievergelt, 2004). One item on performance optimization is developed in accordance with Pongratz and Voß (2003) (e.g. “I don't mind using part of my free time for work.”). *Proactiveness* is measured with six statements of the Proactive Attitude Scale (e.g. “There are numerous opportunities in life that you just have to spot and seize.”) based on Schmitz and Schwarzer (1999).

The EO scale has been formed using factor analysis. Initially, the factorability of the 16 items was examined. All 16 items correlate at least .2 and nine items correlate at least .3 with one other item, suggesting reasonable factorability. The KMO measure of sampling adequacy is .78, above the commonly recommended value of .6. Bartlett's test of sphericity was significant ( $X^2(120) = 1,649.299, p < .001$ ). Given these indicators, factor analysis was considered to be suitable with all 16 items. Principal factor analysis was used to identify and compute composite scores for the factors underlying the 16 items. Initial eigenvalues indicated that the first factor explained 75.5 percent of the variance. This solution was preferred because of the ‘leveling off’ of eigenvalues on the scree-plot after one factor. Two items were eliminated because they did not contribute to the factor and failed to meet the minimum criteria of having a primary factor loading of .3 or above. For the final stage, a principal factor analysis of the remaining 14 items, using varimax rotations with Kaiser-normalization, was conducted, with one strong factor explaining 87 percent of the variance. Cronbach's alpha reached .76.

## Covariates

We include the several covariates as control variables in our analysis. For gender we use a dummy variable (0 = male, 1 = female). The respondent's age is included as a metric variable. In addition to these demographic variables, we have included three variables that are related to the employee's work and the organization he or she is working for. First, a dummy variable capturing whether the respondent is working part-time or full-time is included (0 = part-time, 1 = full-time). The focus of our study are employees in the consultancy sector and in creative professions, so we also asked whether the respondents work organization is mainly project-based or traditional (0 = traditional, 1 = project-based). Furthermore, we control for the occupational status using the first three of the four hierarchical levels (simple function/project assistant, qualified function/project employee, highly qualified function/project leader, and leader/executive as control).

## Model testing

To demonstrate the construct validity of the measures, confirmatory factor analysis (CFA) was performed using the Stata 14 Software package (StataCorp., 2015). The data was tested for multicollinearity, non-normality and outliers (Quiñones et al., 2013). Indicative of outliers were scores with four standard deviations beyond the mean. Data were considered as non-normal with a skewness index over three and a kurtosis index above ten (Weston & Gore, 2006). Multicollinearity was indicated for correlations between the variables higher than .85. The inspection of the data gave no indication of any violation of these assumptions.

In total three CFAs were estimated using the maximum likelihood technique. Model 1 included twelve first order factors<sup>1</sup> derived from their respective items. Model 2 consisted of four factors with job resources and job demands modeled as second order factors, each composed of five dimensions (job resources: emotional strain, cognitive workload, role conflict, workload, time pressure; job demands: decision latitude, growth potential, managerial ability, feedback, social support). Job satisfaction and exhaustion were the other two factors. In Model 3 all items loaded on one factor. The three models were compared based on both relative and absolute goodness of fit indices (Acock, 2013). The three absolute indices were the  $\chi^2$  goodness of fit statistic, the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Squared Residual (SRMR). The two relative indices were the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI). Following Hu and Bentler (1999), good-fit models should have a non-significant  $\chi^2$ , RMSEA smaller than .05 (between .05 and .10 for a moderate or satisfactory fit) and an SRMR smaller than .09. The values for the other indices should be above .95 for a good fit and at least above .90 for a satisfactory fit. In addition, the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used to assess the model with the best fit, in which a smaller value indicates a better fit.

To test whether EO mediates the relationship between job demands respectively job resources and exhaustion respectively job satisfaction a mediator model was fit using the sgmediation program for Stata (Ender, 2012) (Figure 1). Following Preacher and Hayes (2004) and Hayes (2013) we tested the significance of indirect effect using bootstrapping procedures. Unstandardized indirect effects were computed for each of 10,000 bootstrapped samples, and the 95% bias-corrected (BC) confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The estimation of total, direct and indirect effects was performed according to the hypothesized path between the study

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<sup>1</sup> Job satisfaction, exhaustion, emotional strain, cognitive workload, role conflict, workload, time pressure, decision latitude, growth potential, managerial ability, feedback, social support

variables. As suggested by Preacher and Kelley (2011) we calculated and report the standardized effect size  $(\kappa^2)^2$  of mediation.<sup>3</sup>

## Results

### Descriptive statistics

Table 1 shows means, standard deviations and correlations of the study variables. In most cases, the correlations between the two well-being variables - exhaustion and job satisfaction and the study variables are highly significant ( $p < .001$ ). The correlations between the five job resource indicators and job satisfaction are in the range of  $r = .44$  and  $r = .56$ , while the corresponding correlations between job demands and exhaustion are in the range of  $r = .32$  and  $r = .48$ . The correlations are also in the expected direction: job resources correlate positively with job satisfaction and negative with exhaustion (between  $r = -.17$  and  $r = -.36$ ), respectively, job demands correlate positively with exhaustion and negative with job satisfaction (between  $r = -.14$  and  $r = -.35$ ). There is one exception: Cognitive workload correlates positively with job satisfaction ( $r = .21$ ;  $p < .001$ ) and shows no relationship with exhaustion ( $r = .05$ ). The correlations between EO and job satisfaction were also significant ( $r = .39$ ), as well as the corresponding correlation with exhaustion ( $r = -.43$ ).

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Table 2 about here  
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### Confirmatory factor analysis

Three CFAs were estimated to test the distinctiveness of the measures. Model 1 included twelve first order factors and showed a good fit ( $\chi^2 = 2063.36$ ,  $df = 775$ ,  $p = .000$ , RMSEA = .055, SRMR = .075, CFI = .901, TLI = .884, AIC = 73320.14, BIC = 74244.01). Model 2 consisted of four factors (job resources and job demands as second order factors and job satisfaction and exhaustion as the other two factors) yielded an unacceptable fit ( $\chi^2 =$

<sup>2</sup> Preacher and Kelley (2011) suggest to interpret kappa-squared values in the same way as the coefficient of determination ( $R^2$ ), where small, medium, and large effect sizes are stated as .01, .09, and .25 respectively (Cohen, 1988).

<sup>3</sup> Homogeneity of regression tests were conducted to check whether the independent variables interact with the mediator. All p-values of the homogeneity of regression test are non-significant confirming that the effects of EO on exhaustion and job satisfaction do not depend on job resources and job demands.

2703.29,  $df = 825$ ,  $p = .000$ , RMSEA = .064, SRMR = .115, CFI = .855, TLI = .841, AIC = 73860.07, BIC = 74568.09). Model 3, with one factor showed also an unacceptable fit ( $\chi^2 = 6848.19$ ,  $df = 841$ ,  $p = .000$ , RMSEA = .114, SRMR = .141, CFI = .536, TLI = .502, AIC = 77927.98, BIC = 78611.92). These results of the CFAs support that the variables of this study are different constructs and that model 1 is - as the AIC and BIC indices suggest - superior to the other models.

## Mediator analysis

To test the mediation effects of hypotheses 1a, 1b, 2a and 2b we followed Baron and Kenny's (1986) four steps to establish a significant mediation effect. We conducted bootstrapped BC confidence intervals with 10,000 replications to estimate the significance of the indirect effects. The mediation results (standardized regression coefficients) are summarized in Figures 2-5, where the values in parentheses correspond to the effects of job demands and job resources on exhaustion and job satisfaction after controlling for its indirect effects through EO. The respective levels of significance are: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Preacher and Kelly (2011) suggest not only to consider the statistical significance of indirect effects but also to estimate the standardized effect size ( $\kappa^2$ ). Figure 2 and 3 summarize the standardized regression coefficients for the relationship between the job demand and job resource dimensions and exhaustion mediated by EO. In line with hypothesis 1a, our results show that the relationships between emotional demand, workload and cognitive workload and exhaustion are mediated by EO (Figure 2). The bootstrapped unstandardized indirect effects are .04, .05 and -.22, and the 95% bias-corrected confidence interval ranges from .01, .08; .02, .09 and -.29, -.16. Thus, the indirect effects are statistically significant. The standardized indirect effect sizes are moderate to medium:  $\kappa^2 = .063$  for emotional demand,  $\kappa^2 = .073$  for workload and  $\kappa^2 = .192$  for cognitive workload. In other words, lower levels of emotional demand and workload and higher levels of cognitive workload are associated with higher levels of EO, which then lead to lower exhaustion. When it comes to the assumed relationship between the job resources and exhaustion (hypothesis 1b), only decision latitude is mediated through EO (Figure 3). The bootstrapped unstandardized indirect effect is -.10, and the 95% bias-corrected confidence interval ranges from -.15, -.06. Thus, the indirect effect is statistically significant. The standardized indirect effect size is = .098. Higher levels of decision latitude are associated with higher levels of EO, which then lead to lower exhaustion.

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Figure 2 about here

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Figure 3 about here  
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Figure 4 and 5 summarize the standardized regression coefficients for the proposed relationship between job demands, job resources and job satisfaction mediated by EO (hypotheses 2a and 2b). The relationships between emotional demand and cognitive workload and job satisfaction are mediated by EO (Figure 4). The bootstrapped unstandardized indirect effects are -.04 and .18, and the 95% bias-corrected confidence interval ranges from -.07, -.01 and .12, .27. Thus, the indirect effects are statistically significant. The standardized indirect effect sizes are moderate to medium:  $\kappa^2 = .042$  for emotional demand and  $\kappa^2 = .124$  for cognitive workload. Lower levels of emotional demand and higher levels of cognitive workload are associated with higher levels of EO, which then lead to higher job satisfaction. When it comes to the relationship between job resources and job satisfaction decision latitude and growth potential are mediated through EO (Figure 5). The bootstrapped unstandardized indirect effects are .06 and .05 and the 95% bias-corrected confidence interval ranges from .04, .10 and .02, .09. Thus, the indirect effects are statistically significant. The standardized indirect effects are moderate:  $\kappa^2 = .056$  for decision latitude and  $\kappa^2 = .043$  for growth potential. In other words, higher levels of decision latitude and growth potential are associated with higher levels of EO, which then lead to higher job satisfaction.

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Figure 4 about here  
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Figure 5 about here  
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## Discussion and conclusion

Our findings contribute to the existing literature in two ways. First, our data gives support to the conceptual framework of the JD-R model among consultancy and creative professions in the German IT and communications sector. The health-impairment process leading to exhaustion and the motivational process resulting in job satisfaction as proposed by the model even hold true at intercompany level. This said, we have to highlight that cognitive workload does not function as a typical demand for our sample. Maybe cognitive workload in the workplace is seen as a challenge with the opportunity for personal growth and development. Based on a meta-analysis, Crawford, Lepine, and Rich (2010) state that there are two types of demands, challenges and hindrances. The latter refers to job demands as proposed by the JD-R model with a fostering effect on burnout and a negative effect on engagement. There against, challenges are both, demanding and supporting by nature. Particularly for cognitive workload this argument seems reasonable. However, for our sample with consultancy and creative professions no straining effect could be found at all. Quite the contrary, cognitive workload acts like a genuine job resource; it has a negative impact on exhaustion and a positive one on job satisfaction. This may indicate a peculiarity for the population of highly educated employees with a need for challenging jobs.

Second, our analysis of the mediating role of EO in the health-impairment process of the JD-R allows for several conclusions. The findings give support for mediating processes from some specific job demands and job resources through EO. This emphasizes the moderating potential of another distinct personal resource. EO partially mediates the relationship between emotional demand and workload and exhaustion. The negative effect of emotional working conditions is partially reduced through the employee's EO. In other words, the employees perceive a lower exhaustion from demanding working conditions such as emotional demand and workload through their EO. As elaborated above, work in IT and communication sector is mainly organized project-based. Such projects can be motivating due to clear goals, but they are also often demanding through time pressure along with high workload (Gällstedt, 2003). Changing preferences or priorities, or the loss of resources might provoke changes to the set goals and subsequently lead to uncertainty, anxiety and frustration. The employee has to cope with such emotionally demanding situations that influence his or her well-being.

Previous studies have emphasized the role of job resources in the prevention of exhaustions (see Schaufeli & Taris, 2014 for an overview). Within our study this link is supported for the job resources decision latitude and social support as well as for the challenging job demand

cognitive workload. All three dimensions have a lowering direct effect on exhaustion. However, for decision latitude this process is partially mediated and for cognitive workload fully mediated through EO. These findings suggest that job resources - or at least an increased task autonomy and cognitive workload - play a significant role in the lowering of exhaustion through the facilitation of employees' entrepreneurial thinking. Activating this EO can lead to a more positive appraisal of stressful and demanding situations. This is in line with the theoretical proposition that "a positive appraisal style is the key mechanism that protects against the detrimental effects of stress and mediates the effects of other known resilience factors." (Kalisch, Müller, & Tüscher, 2015, p. 1). A similar explanation applies also for the partial mediation between job demands respectively job resources and job satisfaction through EO. Especially, the mediation between the job resources decision latitude and growth potential and job satisfaction suggests that entrepreneurial employees are confident about their capabilities and that they show a competitive seeking and proactive behavior which in turn increases their job satisfaction. In other words, these employees are capable of using their latitude and potential through an entrepreneurial mindset. However, in line with Bandura's (1989) SCT and Hobfoll's (2002) COR this process might also be reciprocal generating EO as a new resource leading to a better well-being.

In conclusion, our findings show that an entrepreneurial oriented employee - seeking for autonomy, optimization, competition and proactiveness - perceives his or her working environment more positive leading to lower exhaustion and increased job satisfaction. This finding can also be linked to job crafting (Wrzesniewski & Dutton, 2001) which describes the reorganization of individual elements of work so that they match the motives, strengths and passion of the person employed to do them (Berg, Wrzesniewski, & Dutton, 2010). Job crafting as a process of proactively influencing one's job can take three different forms: (1) crafting task boundaries (increase or decrease the number of tasks needed to perform or change how they are performed), (2) crafting relational boundaries (change the intensity and number of interactions with others), and (3) crafting cognitions about the job (change the meaning of their job) (Wrzesniewski & Dutton, 2001). In a longitudinal study, Tims, Bakker and Derks (2015) show that employees can increase their own work engagement and job performance through job crafting. EO, explicitly emphasizing a certain form of behavior, such as search for autonomy, performance optimization, competitiveness, and proactiveness, can facilitate job crafting - especially with crafting the cognitions about one's job and with sufficient latitude also crafting the relational boundaries.

Our findings also highlight some practical implications. Due to the wide-ranging digitalization of job tasks in all industries and the broad adoption of IT work organization in other industries (e.g. agile organization), we can assume that the practical impact of our findings

does not only apply to the IT and communication sector but to modern job profiles in agile organizations in general. Companies undergoing reorganization to become more agile should consider the interplay between job conditions and work orientations.

First, owing to the obvious influence of (objective) working conditions on exhaustion and job satisfaction it is important for organizations to (continue to) organize work in such a way that a demands-overload is avoided and resources are developed. Second, employees' work orientation should be an integral element of the human resource management. An EO allows employees, for instance, to react appropriately to stressful situations given they have the autonomy to do so. Possible means to support positive effects of EO could be to assign responsibilities, to offer self-efficacy training and - particularly - to offer incentives that motivate further skill development (e.g., performance appraisals, employee financial participation). Since job satisfaction is a central explanatory variable for numerous individual and organizational results, such as fluctuation, absence, commitment and organizational citizenship behavior, we can assume that such an HR policy would have far-reaching positive effects. However, the risks of an exaggerated EO should not be disregarded. Too intense performance optimization can lead to workaholism, misdirected competitiveness may jeopardize team success and blurred boundaries between work and free time or even the complete absence of these boundaries can lead to an uneven work-life balance.

As with all research, our study has some limitations to be mentioned. The data structure is cross-sectional measured at one point in time. Although we find support for the mediating role of EO, we cannot and don't want to exclude a vice-versa effect as proposed by the job crafting literature. As single-source data, the found relationships may also be affected by common-method bias. We took some procedural precautions (e.g. guaranteeing anonymity, pre-testing the survey and spatial separation of job conditions, mediating and dependent measures) as recommended by Podsakoff et al. (2003). Besides the general limitations of the chosen survey format, there is a reliability matter to be mentioned. Internal consistency of two job resources, social support and feedback is comparably low. A closer look at the operationalization reveals that social support and as well as feedback respectively are separately assessed for relevant peer groups (colleagues and supervisors). This would tend to argue for a formative instead of a reflexive nature of the underlying dimension (Jarvis, MacKenzie, & Podsakoff, 2003). However, since reliability requirements are met, there is no need for adapting scale construction in our case.

Concluding, the presented results provide support for a favorable mediating role of an entrepreneurial personal resource within the JD-R model. This knowledge may be used to organize work in a "healthy" way. However, future research should also broach the issue of

adverse effects related to extreme employee entrepreneurship and potential negative effects.

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Figure 1: Tested mediator model

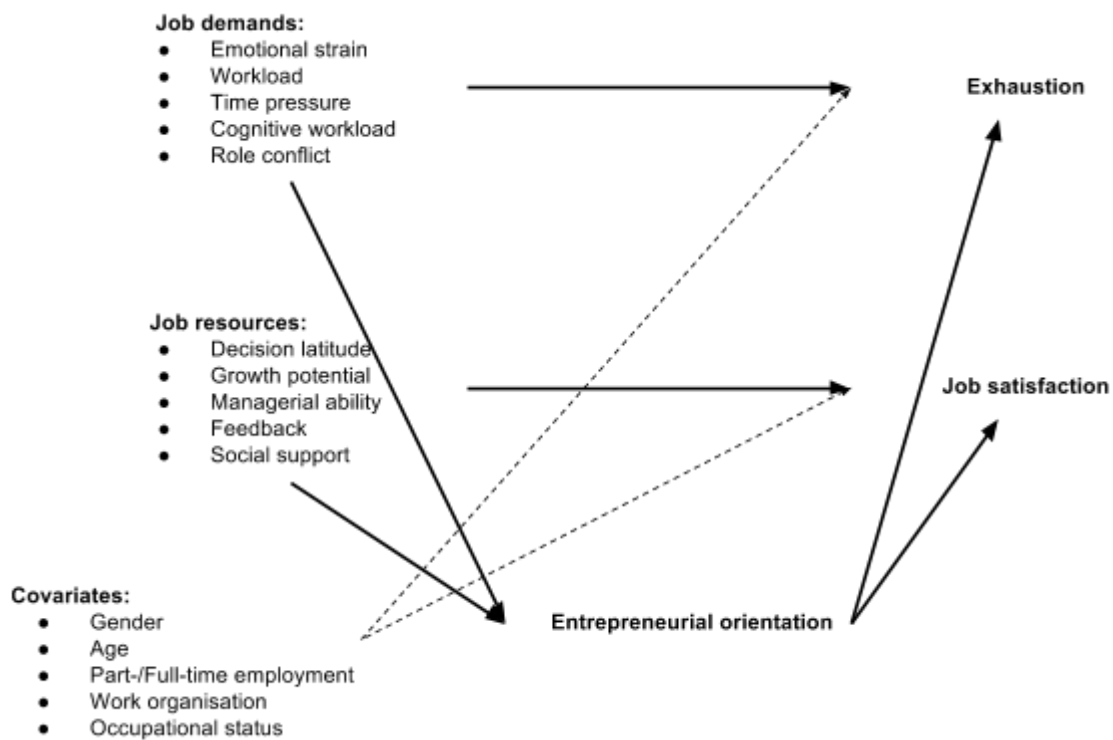
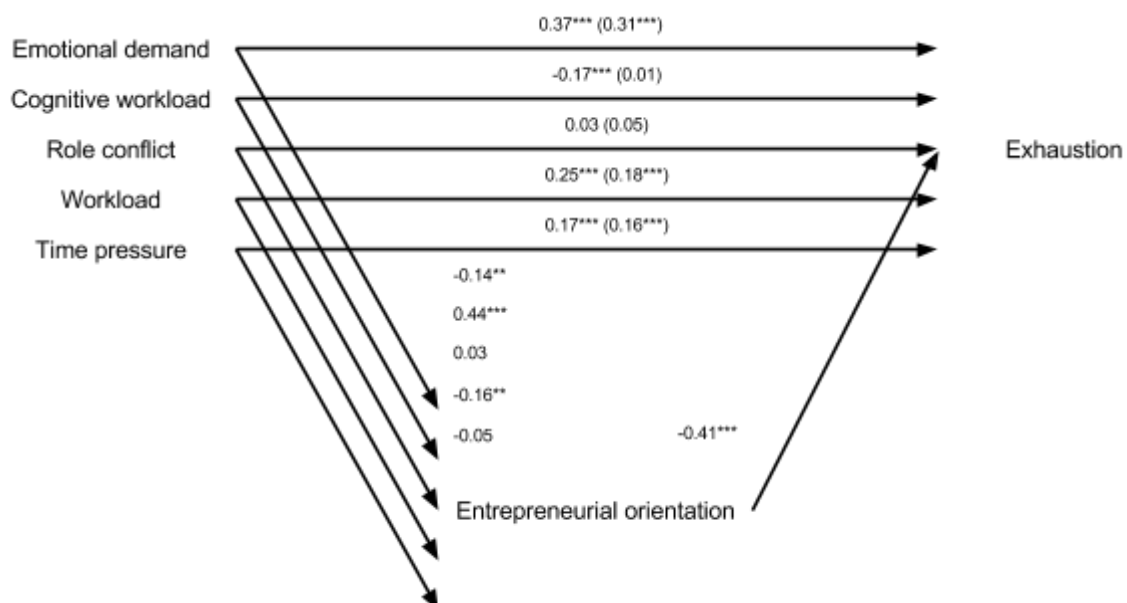
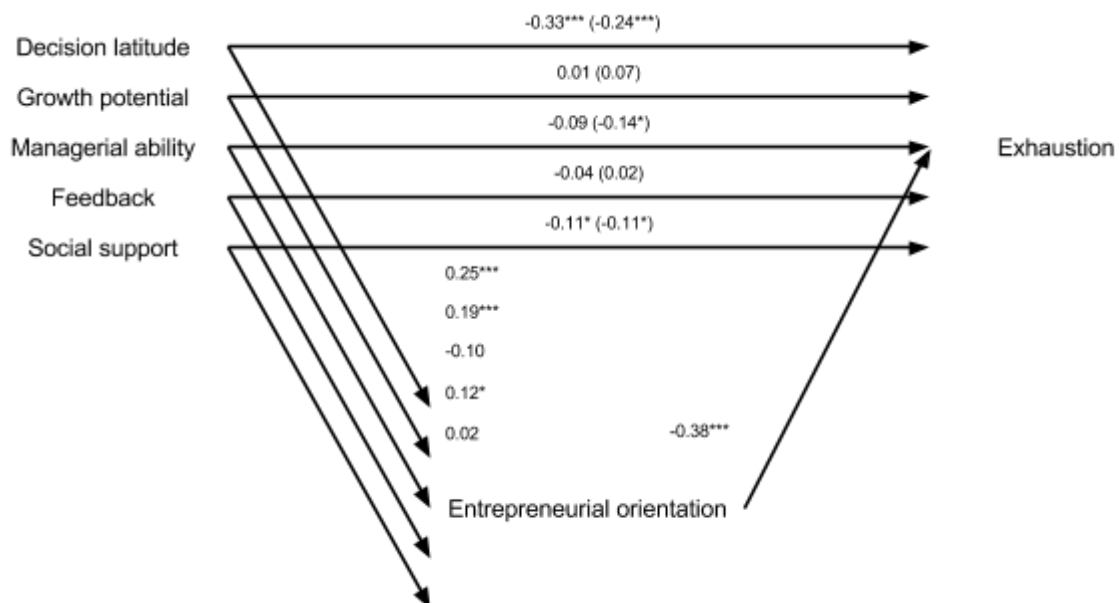


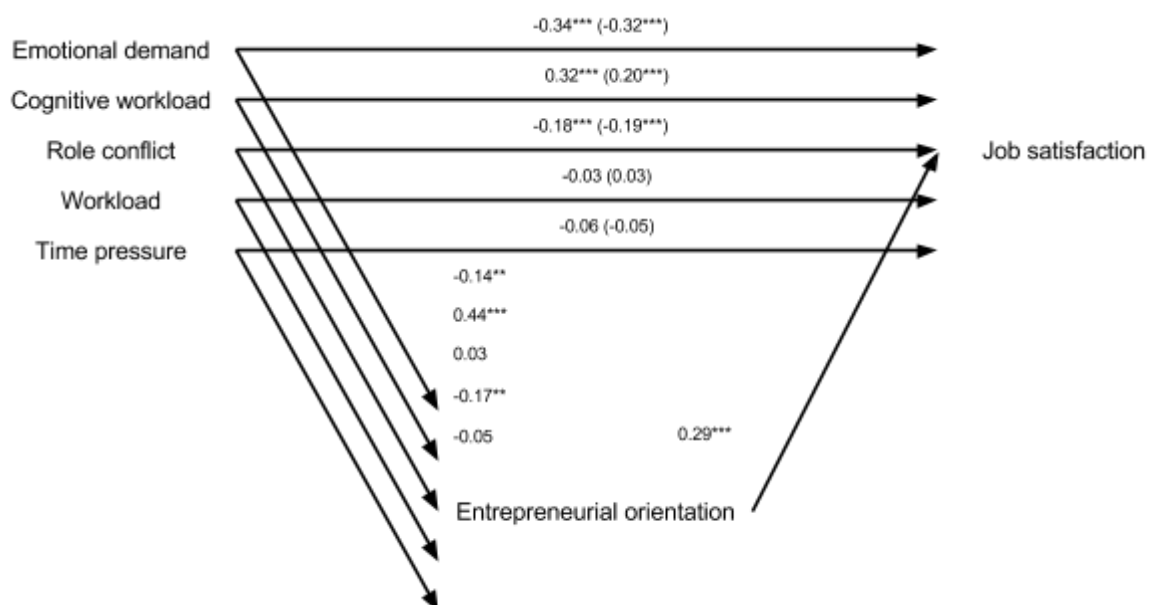
Figure 2: Standardized regression coefficients for the health-impairment process mediated by entrepreneurial orientation



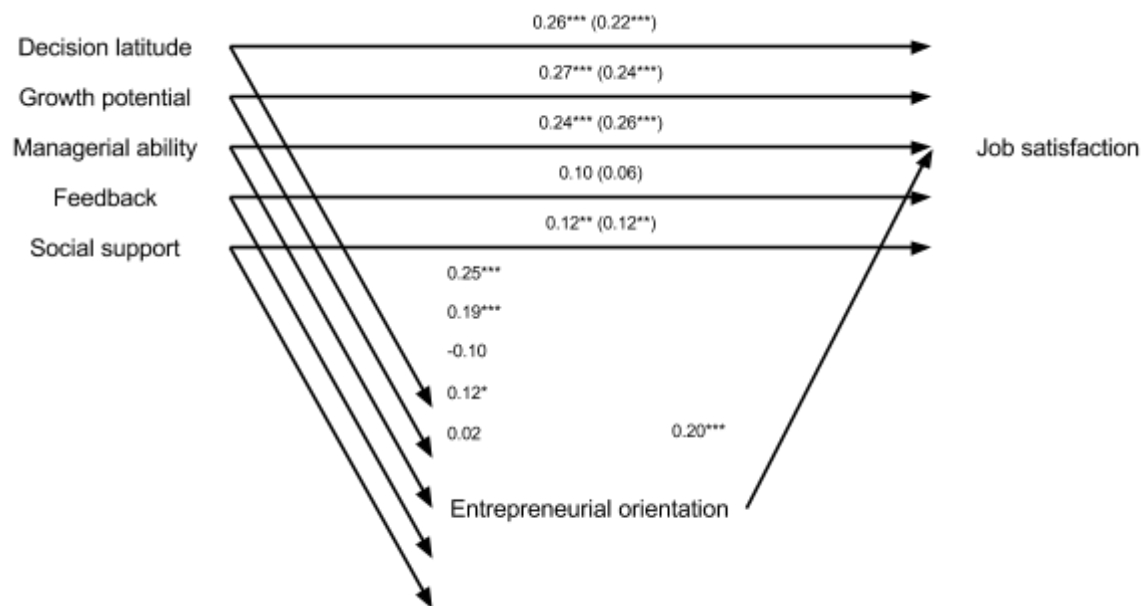
**Figure 3: Standardized regression coefficients for the relationship between job resources and exhaustion mediated by entrepreneurial orientation**



**Figure 4: Standardized regression coefficients for the relationship between job demands and job satisfaction mediated by entrepreneurial orientation**



**Figure 5: Standardized regression coefficients for the motivational process mediated by entrepreneurial orientation**





**Table 2: Mean, standard deviation and correlations**

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Job satisfaction	4.93	1.25	-																			
2. Exhaustion	3.75	1.08	-.48***	-																		
<i>Job demands</i>																						
3. Emotional strain	4.47	1.34	-.35***	.48***	-																	
4. Workload	4.28	1.41	-.14***	.43***	.34***	-																
5. Time pressure	5.08	1.25	-.06	.37***	.33***	.64***	-															
6. Cogn. workload	5.56	.89	.21***	.05	.27***	.31***	.49***	-														
7. Role conflict	4.21	1.29	-.27***	.32***	.55***	.35***	.27***	.28***	-													
<i>Job resources</i>																						
8. Decision latitude	5.52	1.02	.47***	-.36***	-.20***	-.06	-.03	.24***	-.13**	-												
9. Growth potential	5.76	.97	.51***	-.17***	-.04	.16***	.23***	.44***	.04	.30***	-											
10. Managerial ability	4.52	1.59	.56***	-.27***	-.18***	-.02	.02	.18***	-.22***	.32***	.46***	-										
11. Feedback	3.88	1.24	.44***	-.24***	-.11**	-.06	.05	.20***	-.08	.32***	.33***	.49***	-									
12. Social support	5.13	1.05	.48***	-.29***	-.18***	-.08*	-.03	.14***	-.21***	.32***	.33***	.60***	.51***	-								
<i>Entrepreneurial orientation</i>																						
13. EO	5.01	.67	.39***	-.43***	-.05	-.05	.06	.38***	.02	.33***	.27***	.13	.23***	.15***	-							
<i>Covariates</i>																						
14. Gender	.40	.49	-.06	.08	.01	-.05	-.03	-.03	-.15***	-.07	-.13**	-.02	-.03	.00	-.07	-						
15. Age	36.57	7.34	.04	-.13**	.07	-.03	-.02	.11**	.11**	.13**	.13**	-.04	.04	-.03	.04	-.20***	-					
16. Full-time job	.97	.20	.01	.05	.02	.15***	.13**	.15***	.08	.11**	.11**	.08*	.04	.04	.02	-.16***	.06	-				
17. Project-based	.68	.47	.03	.06	.07	.14***	.24***	.13**	.02	.02	.18***	.06	.02	.02	.05	-.06	-.14***	.09*	-			
18. Simple function	.02	.15	-.10*	.04	.00	-.03	-.03	-.09*	-.09*	-.19***	-.14***	-.08	-.04	-.02	-.09*	.19***	-.17***	-.03	-.07	-		
19. Qualified function	.21	.41	-.13**	.01	-.16***	-.12**	-.16***	-.33***	-.11**	-.21***	-.25***	-.06	-.09*	-.07	-.15***	.08	-.24***	-.14**	.03	-.08	-	
20. Highly qualified	.52	.50	.02	.00	.02	.01	-.00	.04	.04	.10*	.07	-.00	-.03	.02	-.02	-.08	.06	.09*	-.12**	-.16***	-.54***	-
21. Leader/executive	.25	.43	.14***	-.03	.12**	.11**	.16***	.30***	.09*	.14***	.20***	.09*	.13**	.04	.20***	-.05	.21***	.03	.14***	-.09*	-.29***	-.60***

\* p &lt; .05 \*\* p &lt; .01 \*\*\* p &lt; .001